DOCUMENT RESUME

ED 171 729 TM 008 606

AUTHOR Johnson, Charles E.
TITLE A Comparative Analysis of Three Basic Designs for Competency Validation.
PUB DATE 13 Jan 77
NOTE 21p.; Paper presented at the Annual Meeting of the Georgia Educational Research Association (1st, Atlanta, Georgia, January 13, 1977) ; Best copy available

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Certification; Educational Objectives; *Evaluation Methods; *Job Skills; Models; *Performance Based Education; Program Development; *Program Validation; *Task Analysis; *Vocational Education

ABSTRACT

Three approaches to validating competencies of vocational education programs in technical and professional schools are examined. Competencies are defined as behavior-oriented and relatively simple, observable behaviors which can be identified and measured by the frequency of occurrence. The three models, which have elements in common, are expert consensus, product assessment, and logical analysis. Using the expert consensus model, competencies are classified into groups having common elements and are validated by submitting questionnaires to specialists who determine which competencies are important to effective job performance. In the product assessment model, the frequency of specific, clearly observable behaviors is noted on checklists through the systematic observation of on-the-job workers. In the logical analysis model, competencies are assumed to be complex constructs rather than objective behaviors. Analysis, inference, and judgment are the techniques used, and conclusions are reasonable assumptions presented as a report or working paper. It is concluded that each of the models is useful, depending on the nature of the competencies to be validated. (MH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

BEST COPY AVAILABLE

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

A COMPARATIVE ANALYSIS OF THREE BASIC DESIGNS FOR COMPETENCY VALIDATION*

Charles E. Johnson, Ed.D.
Professor of Education
University of Georgia
Athens, Georgia 30602

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Charles Johnson
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

ED117729

The Problem

The purpose of this paper is to examine critically three approaches to determining the extent to which the performance aspect of selected competencies, proposed for use in vocational education or certification programs, are valid.

Background and Rationale

It is evident from recent literature that vocational education programs in technical and professional schools are being organized around competencies or the tasks, responsibilities and performances that are eventually required of the learners once they actively enter their selected vocations.

For most educators it appears reasonable to assume that if one seeks to prepare a learner for a particular vocation the instructional program which he uses should be based on an understanding of the competencies that will be required of the worker. The term competency based programs

---

*This paper summarizes the work of the author to date in investigating various approaches to validating vocational competencies. It was presented at the Second Annual Meeting of the Georgia Educational Research Association, at Georgia State University in Atlanta, Georgia on January 13, 1977. The author requests that it not be duplicated or quoted without his permission as it is being submitted in an edited form for publication.

909 800 ut

is presently used with reference to such an approach to instruction. The initial task in designing such a program is to identify and validate the competencies.

Identifying competencies is normally an easier and less research oriented activity than validating competencies. The process of identifying can be accomplished in a number of different ways. One is to call a conference of experts and have them, on the basis of their experience, develop an appropriate list. Another is to observe workers on the job and tabulate each of the many tasks, responsibilities and other performances which they demonstrate. A third could be to collect a number of job descriptions for the vocation and to analyze them, setting down item by item the competencies they suggest. A fourth might be to bring together experts in the vocation and experts in designing instructional programs and to have the two in conference develop the list of competencies essential to effective job performance.

As regards the various approaches to identifying competencies, it is the opinion of the author that none in and of itself is the most effective means of accomplishing the task. Rather it is a combination of various methods that results in a comprehensive list of competencies.

Once a list of competencies becomes available the next task is one of validating each competency. That is, it must be determined how important or essential it is for a worker to possess that competency in order to be adequately equipped to serve his trade or profession. The process of validating with reference to vocational competencies needs further explanation. It should be observed that one does not validate a competency as one validates an assessment instrument. That is, it is not likely for one to modify the competency as one would an assessment instrument

in order to make it valid. Thus, validating a competency means investigating the extent to which a given competency is valid. But, "Valid for what?" Since at the present time vocational competencies are most generally used either as content for instructional programs or as requirements for licenses or certificates to practice the vocation, it appears that the answer to the question is either "valid for inclusion in an instructional program," or "valid as a requirement for acceptance into the vocation." This raises another question: How valid must a competency be in order for it to become a requirement? There is not time to discuss this issue here except to say that one should probably require far less proof of validity for inclusion of a competency in an instructional program than one requires for its exclusion from acceptance in a trade or profession.

Definitions

The nature of the vocation as well as the investigator's orientation to research methodology are both likely to affect how one defines a competency. And how one defines a competency often affects the procedures by which that person would investigate the validity of the competency. For this reason the author feels the necessity of describing two positions with regard to the nature of a competency and how they relate to research. The first is referred to here as the behavior oriented definition and the second, the concept oriented definition. The first defines a competency as a relatively simple, observable behavior which can be clearly identified and precisely measured as to its frequency of occurrence. The second or concept oriented definition defines a competency as a complex concept which is expressed in a comprehensive and often creative performance. The concept oriented requires a broad, cognitive, experiential, and not infrequently an affective base or support system.

Vocations which are skill and technique oriented most often use the first definition, while those which are administrative, professional or artistic more frequently use the second definition. For example, to correctly thread, focus and operate a motion picture projector requires precise skills which can be observed and measured. On the other hand, to design or create a multi-media plan to accomplish a given sales objective is not directly observable, nor is it easily measured. Thus, it is evident that there is more than one type or class of competency and that in some cases the first definition is applicable while in others the second applies.

As regards the researcher's orientation, those who prefer objectivity and precise measurement are prone to admit to only the first or behavior oriented definition. Research using the behavior oriented definition is free from consideration of a whole complex of elusive variables. Undertaking research using the concept oriented definition is indirect and difficult to quantify. It involves concern for such intangibles as the workers' cognitive, affective and experiential background, the specific nature of the objectives being pursued, the concurrent qualities expressed in the product, the performer's intentions, and in some instances even sociological and moral values.

Limitations

This paper proposes to investigate only three possible approaches to validating competencies. There may be many more. Also, it restricts its attention to the uses of those three approaches examining vocational competencies such as those used in trades and professions. Furthermore, it should be explained that the author's experience lies primarily with the investigation of competencies as they relate to the teaching vocation,

and that his experience with other vocational education programs is limited.

The Three Models, Their Commonalities, and First Steps

The three procedural models for competency validation presented in this paper are expert consensus, product assessment, and logical analysis. Here a model is a design, or a method in its pure form which means it is generic in nature and reflective of how the approach is normally or typically implemented. In each case the titles for the models indicate acceptable criteria for determining the extent to which a given competency is important to a particular vocation. Table 1 on page 6 summarizes the characteristics of the three models by contrasting their more outstanding features.

In a discussion of the three models one must keep in mind that although this paper stresses the differences among them, in reality, they have much in common. First, they all seek to determine the extent to which some performance associated with a vocation is essential or at least important to that vocation. Second, they all focus on the performance aspect of the competency. That is none of them is primarily concerned with the worker's knowledge, his experience, his attitudes or his personal attributes; rather, they focus on what the worker does. Third, all of them imply that some form of job performance assessment or evaluation activity will sometime take place. Finally, each assumes that there is a set of competencies to be investigated.

Expert Consensus

The expert consensus model begins by giving order to the competency statements they have acquired. First, the competencies are grouped into those having similar meaning. A researcher might begin by dividing the

Table 1

Three Models for Investigating the Validity of Vocational Competencies

Characteristics of the Model	Identification of Models		
	Expert Consensus	Product Assessment	Logical Analysis
Investigation procedures	Experts' opinions are obtained and systematically examined to determine the extent to which they concur as to the need for the competency.	Data obtained from systematic observation of the extent to which workers use the competency is examined in relation to the quality of their products.	The objectives and general nature in relation to the broader purposes of the vocation are examined. Knowledge (facts, principles, values, etc.) from a variety of sources is used to make judgments.
Tools and techniques	Interviews and surveys using checklists and questionnaires are conducted.	Systematic observation of workers on-the-job with checklists and guides for recording frequency are used.	Analysis, reflective thinking, inference, and judgment, summarized in propositions, treatises, and theses suggest the main tools and techniques.
Validity criteria	Valid competencies are those which experts say are important to effective job performance.	Valid competencies are those which are performed by workers whose performance results in satisfying the job's objectives.	Valid competencies are those which are logically essential to effective job performance.
Analysis and conclusions	The differences between means, distributions of sets of scores, and the rank order of opinions on a number of competencies are used.	Differences between means and distributions of sets of scores relating to frequency of occurrence are used.	Reflective thinking, logic, and inference are used.

set of competencies into those which are used by salespersons working directly with the buyer, and those which they use when they are not directly engaged in selling. For teachers the competencies might be clustered in a number of functions such as: planning instruction, managing instruction, providing a learning environment, evaluating learners, evaluating the program, and professional performance.

The classified list of competency statements is then ready to be used for the construction of a questionnaire or opinionaire designed to obtain the views of specialists as regards those particular competency statements. Depending upon the resources as well as the importance of the task on hand, investigators decide whether or not interview techniques or survey techniques will be used. Once matters such as these are agreed upon, the details for procedures and design of the tools for inquiry are established. In designing a questionnaire, one must prepare for the eventual necessity of quantifying the data. For this reason one normally assigns quantitative indicators to each item on the scale for responses. For example, where a three-point scale is used +3 might be used for essential, +2 for highly desirable, +1 for desirable and "0" for "none of these." Normally if all items in the questionnaire are selected because they are initially hypothesized to be positive, a negative value is omitted.

When the survey is conducted, care is usually taken to be certain that the sample of respondents whose data are used is reflective of whatever population of vocational workers is being investigated. Thus, some form of stratified sampling is normally used. In order to be certain of the extent to which the sample is representative of the general population, confidence limits for the sample are usually maintained.

Analysis of the data usually involves comparing mean scores, examining the distribution of scores, and arranging the competencies in rank order. Conclusions are drawn in relation to the task to be accomplished with the competencies which were selected. For example, if the task is setting a minimum level of performance for licensing, then investigators may conclude that a relatively few of the high ranking competencies declared to be essential are adequate for construction of a device to be used for licensing or certifying for the vocation. On the other hand, if the competencies are to be used for education and the vocation is one critical to life but provides an adequate time period for training, then any competency within the range of "reasonably useful but seldom used" to "essential for the successful completion of each day's work" would be included and recommended for the training program.

Product Assessment Model

The product assessment model also begins, like the others, with a collection of competencies which, according to some authorities, are in need of validation. However, persons using the product assessment model are not likely to reorganize the statements into broader categories as was the case with persons using the expert consensus model. If any reorganization is attempted an investigator using this model is most likely to reduce the competency to a singular behavior which is clearly objective in nature. By using specific clearly observable behaviors as competencies the fact of their occurrence as well as frequency of their occurrence may be directly observed. Thus, the process of measurement is more easily and exactly accomplished than would have been the case had the concept or broader definition been employed.

The product assessment model contains three major process elements. They are:

1. Develop procedures for describing the performances of the vocation in a quantitative manner.
2. Study the relationships between the identified performances (competencies) and the quality of the product produced by the worker utilizing the competency.
3. Perform experimental studies in which the significant variables obtained in the studies (competencies) are tested in more controlled situations.

The reader is cautioned to avoid assuming that the above processes must be implemented in the order given. Order is not a major concern. Regarding this point Rosenshine (see Rosenshine, "The Use of Direct Observation to Study Teaching" in R.M.W. Travers, Ed., Second Handbook of Research on Teaching, page 222), with reference to the vocation of teaching, regards the aforementioned set of elements to form a paradigm, and labels it "The Descriptive-Correlation-Experimental Loop" pointing out that the sequence of these steps is not fixed. He says, "These steps are not isolated one from another; research at each step should influence modification of research at other steps."

As regards the development of procedures for describing the performances of the vocation in a quantitative manner some sort of checklist or inventory is created. This inventory normally lists all of the competencies or behaviors that are to be investigated in a left hand column, and to the right provides columns in which to record responses. The right hand columns in most cases are found to provide for the responses of an observer as to the frequency with which the behavior occurs. Sometimes an entire page is devoted to one competency and the items listed in the

left hand column are behaviors reflective of that competency which are called indicators.

A time frame is usually established for the use of the inventory. For example, where a worker is engaged in a job which keeps him in a particular location for a number of hours each day, the observer might be instructed to keep in mind one (or perhaps two, as many as three) behaviors and to record the number of times this behavior (or these behaviors) occurs during that five-minute period. Several minutes later, or perhaps the next day or the next week, the observer might be called upon to observe again for the same behaviors. The selection of times for observations is a systematic selection made within defined restraints.

In addition to requiring an instrument which describes the performances of the vocation, the product assessment model requires information as to the expected quality of the desired product, and some means of determining the extent to which any given product satisfies these quality specifications. Thus, this approach to validation must have a blueprint, set of objectives, or list of specifications for desired outcomes. Also, if it is to assume that the vocational worker was the change agent, information must be obtained as to the conditions of the setting or materials prior to the intervention of the worker, and information as to the extent to which the objectives or specifications have been met when the task is finally completed.

To interpret its data and report its findings, the product assessment model must respond to the same question as was previously the case. That question is: To what extent is this competency (or set of competencies) related to the successful attainment of the objectives? Or, in simpler language, to what extent is this competency important to this vocation?

The relationship is usually expressed in statistical comparisons which are interpreted in terms of probability.

Logical Analysis

The logical analysis model assumes that a competency is a complex construct or concept rather than an objective behavior. Also, the use of this approach to validating competencies requires that a distinction be made between the statement of the competency and the competency or concept itself. The statement of the competency is considered to be only a graphic representation or indicator; it presents, in a sentence or less, a simple description of the behavioral aspect of a relatively sophisticated concept of performance.

Implementing this model is a matter of conducting a number of what may appear to be drab and uninteresting activities. Included are reflective thinking, searches for references, consulting, weighing evidence, making high inference judgments, and arriving at tentative but workable conclusions.

Logical analysis normally treats each proposed competency separately. First, it seeks to clarify the nature of the competency by preparing an expanded written description of the competency including information regarding the intent of the performance, its objectives, the materials or equipment it requires, and something with regard to how it appears when it is being implemented. Once there is consensus as to the nature of the competency as a concept, there follows a search for definitions, facts, principles, hypotheses, assumptions and values to either support or refute the competency as a performance essential to the conduct of the vocation.

Thought is the main ingredient in the next step in logical analysis which is that of relating the findings, making references, and arriving

at conclusions. The kinds of inquiries which are made are reflected in such questions as: What should be the intent of the performer as he engages in this competency? Is this the kind of competency which must be carried out with technical precision to the extent that variation from established behavior would fail to fulfill the intent of the performance? Or is this the kind of competence which requires that one adapt his performance so as to account for differences in conditions in the nature of the materials, equipment, or emotions with which he is working? What prompted someone to present this competency for consideration? Do they regard it as more efficient, more effective, or do they regard it as "right" from a value viewpoint (morally good or beautiful)? If it is a value, by whose authority is it morally "right" or artistically "beautiful"?

This type of investigation does not attempt to quantify data and report its conclusions with statistical comparisons or other such number oriented reports. Its report may be simply a working paper, an unpublished thesis or dissertation, or a summary of any of these. One form for reporting the results of logical analysis in validating competencies for teachers is illustrated in Proposition A and Proposition B contained on the following pages. Each presents the competency statement, describes briefly the competency as a concept, and then presents the reasonable assumptions (definitions, facts, principles, etc.) to substantiate a conclusion which follows.

Proposition A

Competency statement: The teacher plans instruction to be compatible with the personal capabilities and needs of learners.

If the following is what is meant by the competency statement:

In order to make instruction worthwhile the teacher, in advance of the instructional period, prepares plans for conducting the lesson or activities. These plans are appropriate in terms of the long-term objectives for instruction, the nature of the subject matter being taught and the resources available for instruction.

The teacher's plans may seldom be in written form but they are, nonetheless, made. Teachers who have made adequate plans for a lesson or activity can answer questions such as the following before instruction is begun: What are the purposes of this lesson or activity? What might the learners know or be able to do after the lesson has been completed that they cannot do now? What materials or equipment will be used in the lesson or activity? How will they be used? How do you know that the learners who are to participate in this lesson are ready to do so? What special arrangements have been made in this lesson for students who learn more rapidly than average? . . . those who learn slower than average?. . . those whose interests differ from those of the majority of the group?

And if the following definitions, facts, and principles are reasonable assumptions:

1. To plan is to create in thought a sequence of events suitable for achieving some desired condition at a later date.

2. A plan may or may not be in written form.

3. Instruction which is compatible with the personal capabilities of the learner is instruction which comfortably challenges the learner to make progress.

4. The personal capabilities and needs of learners vary from learner to learner.

5. A lesson or learning activity is a set of events which is designed to affect the student in such a manner that he progresses in relation to a given objective.

6. Planned events normally result in greater success in relation to the attainment of an objective than do unplanned events.

7. Instructional goals, objectives, learning materials, and methods that challenge the learner are more effective than those which are beyond or beneath his capabilities.

Then it logically follows that there is adequate evidence to regard the following competency as a valid criterion for effective teaching: Plans instruction compatible with the personal capabilities and needs of learners.

Proposition 8

Competency statement: The teacher obtains information about the needs and progress of individual learners.

If the following is what is meant by the competency statement:

The teacher, in an effort to make instruction more effective, seeks information about the learners in his classes regarding their personal needs in relation to the instructional objectives, and the extent to which they progress in attaining those objectives.

Depending upon available resources, the nature of the subject matter being taught, and the uses to which the learner might put the learnings, the teacher obtains information regarding the students' needs and uses it to enhance instruction. Teachers demonstrating this competency, if asked, can answer such questions as the following regarding individual learners in their classes: Why does this student believe he is taking this particular course? What "good" does this student think this course will do him? How does this student think he will use the learnings he acquires in this course?

Also, appropriate to the conditions of the learning environment, teachers in using the competency assess (incidentally or formally) the learners before instruction is begun to determine the extent to which they can already perform the skills or demonstrate proficiency in the knowledge which the proposed instruction would have them acquire. Following instruction, teachers demonstrating this competency determine the extent to which the learners have acquired the intended learnings through some form of evaluation.

And if the following definitions, facts, and principles are reasonable assumptions:

1. The term learner's needs means a summation of the learner's personal goals and objectives in relation to the goals and objectives of instruction.
2. The term progress means the extent to which the learner has attained the objectives of instruction.
3. Each individual learner's needs (aspirations, objectives, goals; social, psychological, physical) differ to some extent from those of his peers.
4. Learners tend to progress more rapidly in acquiring instructional objectives when they feel that these objectives relate to their personal needs.
5. Teachers can usually plan instruction so that learners can relate their personal needs to the instructional objectives.
6. Teachers can sometimes plan instruction so that the learner while pursuing his personal objectives concurrently satisfies his instructional objectives.
7. Each learner progresses at his own individual pace toward acquiring any given set of desired educational outcomes.
8. Evaluation of the learner's needs and progress requires thoughtful consideration of the learner's unique capabilities, strengths, and weaknesses.
9. A learner should be given opportunities to pursue his own personal objectives through his educational activities.

Then it logically follows that there is adequate evidence to regard the following competency as a valid criterion for effective teaching: Obtains information about the needs and progress of individual learners.

A Comparison of the Models as to Their Effectiveness

Having presented three models for determining the extent to which a competency is valid, it becomes the author's obligation to discuss which of these models, if any, is in his opinion more effective than the others. Thus. a discussion of each follows.

As regards the expert consensus model much depends upon the expertness of the experts who make the decisions. If they are truly equipped to make sound judgments and engage in doing so with conscientiousness, then it is likely that their conclusions as to the validity of any given competency will represent dependable views. On the other hand, if the experts are not well selected and if they do not perform conscientiously, then their conclusions are likely to be undependable. Also, this approach risks the dangers of validating competencies on the basis of the vocation as it is known to be, not as it should be. If this were to happen, then training programs based on such lists of competencies could waste learner's time having them acquire performances which are no longer needed, but which by the force of tradition have been retained in the repertoire of skills and responsibilities normally considered necessary for workers in particular trades or professions.

On the positive side, it may be that the expert consensus model under certain conditions is of greater value in validating concept oriented competencies than is the product assessment model since it permits high inference. Also, it should be noted that in the absence of any other source of valid competencies the expert consensus model, with relative ease provides a list of competencies which are better than no list at all, and which are likely to have the acceptance of a number of experts or leaders in the vocation. Finally, it should be observed that in the

courts, when there are disputes as to the qualifications of one vocational worker over another, the opinions of experts regarding such competencies are highly regarded as evidence.

The product analysis model is most valuable in providing data relative to the validation of the behavior oriented competencies. For example, the product analysis model can provide precise data with regard to the frequency with which certain tools and materials are used or techniques are demonstrated. It can also relate the frequency of such performances to the quality of the product (inferior, acceptable or superior). It can also account for the quality of the input prior to processing. However, this model is ineffective in providing evidence relative to the effectiveness of competencies when there are a variety of appropriate behaviors which may be used to fulfill them. Also, competencies which are value oriented, or relate to creative expression are likely to be poorly assessed by the product analysis model. For example, let us consider the competency presented in Proposition A, "The teacher plans instruction to be compatible with the personal capabilities and needs of the learners." There is great variety among learners, lessons, materials, equipment and teachers. It is probable that no two teachers will ever (or should ever) demonstrate this competency in a singular manner. It is also probable that if one hundred excellent teachers were observed in the process of demonstrating this competency each would use a number of behaviors which differed from those of his colleagues. Thus, this approach cannot be used with competencies which are repesented by complex concepts. So, either the competency is redefined into number of behaviors, or some other method of assessing is undertaken. If the competency is redefined into numbers of individual behaviors, it then loses its completeness as a

concept and the behaviors being examined in isolation of the competency lose their value as indicators of a single purposeful performance. Also the product analysis model deals with one competency at a time in relation to the product. For this reason one can never be certain of the reason why a competency is not effective. For example, a physician may be a fine diagnostician but a poor surgeon. Thus, the product or patient may do excellently through all the preliminary preparation but end up a loss during surgery.

Logical analysis is not likely to have many endorsers among researchers in professional education. This may be due to what they see to be possible misapplications or misuses of such analyses, to misunderstandings regarding the procedures, or a neglect of such approaches in the graduate colleges where the researchers were trained. There is also the possibility that it may be due to a devotion to traditional objective experimental design that has resulted in feelings or emotions of inadequacy when high inference models are suggested as possible tools for validating. In any event, for these reasons and perhaps others, this model may continue to lack for endorsers.

However, should educational researchers accept the logical analysis or a similar model as a sound approach to validating competencies, then we would have a reputable means of investigating the concept oriented competency which we do not have at present. The expert consensus model provides supportive evidence only by numbers of workers who say the competency is important, but offer no rationale or proof, and the product assessment model separates the competence into observable behaviors and computes only the frequency with which successful workers use it. When handled intelli-

gently and conscientiously with the logical analysis approach, concept type competencies can remain total entities, be related to their objectives, be treated in a comprehensive manner, take into account values, and provide openly for public examination and criticism, the evidence upon which the conclusions were drawn. It could accomplish this in a manner such that large numbers of those who might be affected by the decisions could understand them. It should also be pointed out that professional, creative, and administrative vocations are the ones most in need of competency validation, and that these are the ones which depend most upon the concept oriented definition for a competency.

Conclusions

After reviewing the three approaches to competency validation used here the author concludes that if:

1. There are various kinds of competencies, some are precise, technical and behavior oriented while others that are more like constructs or concepts in that they have broad cognitive, psycho-motor, and value bases.
2. The concept oriented competencies, when performed, may because of the complex nature of the task and complex nature of the performer, be presented in a different manner each time it is implemented; it may therefore be that the consistent observable behaviors common to all demonstrations have no direct relationship to successful attainment of the goals or objectives.
3. Validity is a relative term; to validate is really to determine the extent to which a competency is valid.
4. Validity must be in relation to some objective: for example, a competency which is valid for use in an instructional program

may not be sufficiently valid for licensing and vice versa.

5. Some models are more effective in determining the extent of the validity of some types of competencies than they are in determining the extent of the validity of other types.
6. These are the only three approaches to competency validation being considered.

Then it may be inferred that:

1. All three models reveal useful approaches and should be given consideration when validating competencies.
2. The model which best meets the needs of a particular validating problem should be adapted and applied to the needs of that situation and should be used in preference to the others.
3. Ideally, to validate a concept oriented competency an investigator might use all three approaches: logical analysis provides a broad inspection of the competency in terms of interdisciplinary and social criteria, product evaluation analyzes in terms of its many behavioral aspects, and expert consensus gives it a credibility that is only earned through the endorsement of the leadership of the vocation.

"THERE ARE SOME GOOD INDICATIONS THAT EDUCATIONAL RESEARCH MAY HAVE REACHED A CRISIS STAGE WITH REGARD TO ITS MAJOR FISHERIAN EXPERIMENTAL DESIGN TRADITION, AND PERHAPS THAT PARADIGM HAS NEVER WORKED."

A. Jon Magoon, Univ. Delaware
Review of Educational Research
Fall, 1974.

* * * *

DEFINITION OF A CONSTRUCT

"...AN IDEA DEVELOPED OR 'CONSTRUCTED' AS A WORK OF INFORMED, SCIENTIFIC IMAGINATION: THAT IS, IT IS A THEORETICAL IDEA DEVELOPED TO EXPLAIN AND TO ORGANIZE SOME ASPECTS OF EXISTING KNOWLEDGE."

APA Standards for Educational and Psychological Tests, 1974.

* * * *

"...MAN IS...SUSPENDED IN WEBS OF SIGNIFICANCE HE HIMSELF HAS SPUN, I TAKE CULTURE TO BE THOSE WEBS, AND THE ANALYSIS OF IT NOT AN EXPERIMENTAL SCIENCE IN SEARCH OF LAWS BUT AN INTERPRETIVE ONE IN SEARCH OF MEANING..."

C. Geertz
The Interpretation of Culture
Basic Books, 1973.